

What is claimed is:

1. A turret-type winder comprising:

first and second rotatable end support members;

two pairs of first and second spindle support assemblies that are movable along respective guide tracks that are disposed outside of the first and second rotatable end support members, each spindle support assembly having a spindle bearing housing that extends through an opening formed in one of the first and second end support members, each of the spindle bearing housings has a drive feature disposed therein for coupling with and for driving a spindle that supports one core for winding rolls thereon, the first and second spindle support assemblies of each pair being drivable along the guide tracks in directions both toward and away from the end support members to accommodate spindles of varying lengths; and

two pairs of pack roll support assemblies that are disposed concentric with and rotatable about the spindle bearing housings, one for each spindle end, each of the pack roll support assemblies having a carriage that controllably travels along a length thereof, the carriage rotatably carrying one pack roll that is pivotably movable into contact with one core with a winding roll thereon so that a web leading onto the core from a roll changer contacts the associated pack roll at or prior to winding thereof on the winding roll for effectively excluding entrapped air prior to forming of convolutions on the roll in a winding position.

2. The winder of claim 1, wherein each of the first and second spindle support assemblies includes a spindle support that travels along the guide tracks, the spindle bearing housing being mounted to and extending outwardly from the spindle support.

3. The winder of claim 2, wherein the drive feature is a first drive shaft that is disposed in and supported by bearings in the spindle bearing housing, the first drive shaft being rotatably driven within the spindle bearing housing with one end of the first drive shaft being coupled to the spindle such that rotation of the first drive shaft is translated into rotation of the spindle.

4. The winder of claim 2, further including:  
a drive source having a first drive gear; and  
a main drive gear rotatably coupled to and driven by the first drive gear,  
wherein the main drive gear is coupled to one of the end support members such that rotation of the main drive gear is translated into rotation of both of the end support members.

5. The winder of claim 4, further including a plurality of cross support members that extend between the end support members and extend outside of the end support members, the cross support members housing a pair of spindle drive screws, one associated with each spindle support assembly, each spindle drive screw

being operatively coupled to one of the spindle supports such that rotation of the spindle drive screw is translated into movement of one pair of opposing spindle supports along respective guide tracks.

6. The winder of claim 5, wherein the cross support members are arranged to form two linear cross support members that extend through openings formed through the end support members as well as each extending between the end support members.

7. The winder of claim 5, wherein a section of the cross support members are mounted to and extend between the idler gear and one of the end support members, with another section of the cross support members being mounted to and extending between the other end support member and a rotatable spindle guide support member, one pair of the guide tracks being mounted to and extending between the idler gear and one end support member, while the other pair of guide tracks being mounted to and extending between the spindle support member and the other end support member.

8. The winder of claim 1, wherein the two pairs of first and second spindle support assemblies are rotatable in unison with the end support members.

9. The winder of claim 1, wherein each of the pack roll support assemblies includes a pack roll support member on which the carriage travels in a controlled, guided manner, the pack roll support member having an opening formed therethrough that receives one respective spindle bearing housing to permit the pack roll support member to be rotatable about the spindle bearing housing.

10. The winder of claim 9, wherein the pack roll support member includes a pair of ball bushing slides that guide the travel of the carriage along the pack roll support member.

11. The winder of claim 1, wherein the pack roll support assembly is driven to rotate the pack roll support assembly about the spindle bearing housing.

12. The winder of claim 1, further including:  
a pack roll positioning assembly for controllably driving the carriage along the pack roll support assembly, the pack roll positioning assembly including a drive screw mechanism that cooperates with the carriage to cause the controlled movement of the carriage.

13. The winder of claim 12, wherein the drive screw mechanism includes a motor that is in communication with a master controller that sends a control

signal to the motor to cause the motor to operate for a pre-selected period of time to cause the carriage to move a predetermined distance.

14. The winder of claim 12, further including:

a mechanism for causing movement of the pack roll relative to the spindle and the pack roll support assembly, the motion of the mechanism being independent from the motion of the carriage along the pack roll support assembly.

15. The winder of claim 14, wherein the mechanism comprises:

a pneumatic cylinder that is coupled to and movable with the carriage, the cylinder having an extendable and retractable piston; and

an arm coupled to the piston, wherein the pack roll is coupled to the arm such that movement of the arm is translated into a movement of the pack roll.

16. The winder of claim 15, wherein the piston is movable between an extended position and a retracted position, the pack roll being positioned in a forwardmost position closest to the respective core when the piston is in the retracted position and the pack roll being positioned in a rearwardmost position farthest from the respective core when the core is in the extended position.

17. The winder of claim 15, further including:

a pressure regulator operatively coupled to the pneumatic cylinder to ensure that the pneumatic cylinder is continuously operated so that the pack roll applies a substantially constant pre-selected amount of pressure on the winding roll.

18. The winder of claim 15, wherein the mechanism has a range of movement such that once the mechanism approaches an end of the range of movement, a control signal is sent to a motor that drives the carriage resulting in the motor being activated for a pre-selected period of time or speed, whereby the carriage is driven a distance away from the winding roll, the pack roll remaining in contact with the winding roll and applying a substantially constant pressure thereagainst.

19. The winder of claim 18, wherein a limit switch or other control device is tripped by the mechanism near the end of the range of movement, the tripping of the limit switch or control device causing the control signal to be generated and delivered to the motor that drives the carriage.

20. The winder of claim 1, wherein the roll changer is movable along a guide tracks both towards and away from the winding roll, the roll changer including a bumper roll assembly that can be actuated to drive the web material into contact with a new core to initiate winding of the web therearound, the roll changer further including a cutting assembly to cut the web downstream of where the bumper roll assembly contact the web.

21. The winder of claim 1, wherein the first and second end support members are rotated 180 degrees to move one pack roll and new core from a transfer position to a winding position for receipt of the web when the roll changer is actuated, while the other core is moved 180 degrees to an unloading position, the winding of the other core being continuous until the roll changer is actuated to cause the web to wind around the new core.

22. A turret-type winder comprising:

a rotatable turret assembly having a first winding roll core and a second winding roll core supported thereby, the turret being rotatable so that the first winding roll core is positioned in a winding position while the other of the second winding roll core is positioned in a transfer position and then the second winding roll core is rotated to the winding position after the winding is completed on the first winding roll core and the first winding roll has been removed;

a pack roll assembly associated with each of the first and second cores, the pack roll assembly including one pack roll that is movable into contact with one core with a winding roll thereon so that a web leading onto the one core from a web source contacts the associated pack roll at least at a point where the web contacts and winds on the winding roll for effectively excluding entrapped air prior to forming of convolutions on the roll in a winding position; and

wherein, without further rotation of the turret, the first winding roll is





new core to be rotated to the second location, while the core with the winding roll thereon is rotated to perform unloading at the first location without any interruption of winding thereon.

24. The winder of claim 23, further including:

first and second rotatable end support members;

two pairs of first and second spindle support assemblies that are movable along respective guide tracks that are disposed outside of the first and second rotatable end support members, each spindle support assembly having a spindle bearing housing that extends through an opening formed in one of the first and second end support members, each of the spindle bearing housings includes a drive feature for coupling with and for driving a spindle that supports one core for winding rolls thereon, the first and second spindle support assemblies of each pair being drivable along the guide tracks in directions both toward and away from the end support members to accommodate spindles of varying lengths, wherein the pack roll assemblies are disposed concentric with and rotatable about the spindle bearing housings, one for each spindle end, each of the pack roll assemblies having a carriage that controllably travels along a length thereof, the carriage rotatably carrying one pack roll.

25. The winder of claim 23, wherein each of the pack roll assemblies includes a pack roll support member on which the carriage travels in a controlled, guided manner, the pack roll support member having an opening formed therethrough

that receives one respective spindle bearing housing to permit the pack roll support member to be rotatable about the spindle bearing housing.

26. The winder of claim 25, wherein the pack roll support member includes a pair of ball bushing slides that guide the travel of the carriage along the pack roll support member.

27. The winder of claim 25, wherein the pack roll assembly is driven by a motor for rotating the pack roll support assembly about the spindle bearing housing.

28. The winder of claim 23, further including:  
a pack roll positioning assembly for controllably driving the carriage along the pack roll support assembly, the pack roll positioning assembly including a drive screw mechanism that cooperates with the carriage to cause the controlled movement of the carriage.

29. The winder of claim 28, wherein the drive screw mechanism includes a motor that is in communication with a master controller that sends a control signal to the motor to cause the motor to operate for a pre-selected period of time or speed to cause the carriage to move a predetermined distance.

30. The winder of claim 23, further including:

a mechanism for causing movement of the pack roll relative to the spindle and the pack roll support assembly, the motion of the mechanism being independent from the motion of the carriage along the pack roll support assembly.

31. The winder of claim 23, wherein the pack roll contacts the core at a tangential point of the web onto the winding roll.

32. A turret-type winder comprising:

a rotatable turret assembly having a first core and a second core supported thereby, the turret being rotatable so that the first core can be positioned at a first location while the second core is positioned at a different second location, wherein a web material can be wound onto either of the first and second cores at either of the first and second locations;

a pack roll assembly associated with each of the first and second cores, the pack roll assembly including one pack roll that is movable relative to one core with a winding roll thereon so that a web leading onto the one core from a web source contacts the associated pack roll in a winding position at either of the first and second locations and locations therebetween; and

wherein each of the first and second cores is unloaded at the first location after the winding is completed thereon and a new core is loaded at the same first location, while the other of the first and second cores is continuously winding at the second location, the turret and pack roll assemblies being configured to permit the

